

We claim:

1. An image processing apparatus for use with a printed substrate, the image processing apparatus comprising:
5 a first processor that receives an acquired image from a printed substrate;
and
a second processor that receives the same acquired image from the printed substrate;
wherein both the first and the second processors are capable of processing
10 the spectral information from the acquired image.
2. The image processing apparatus of claim 1, wherein the first processor includes a large format sensor, and wherein the second processor includes a small format sensor.
15
3. The image processing apparatus of claim 1, wherein the first processor includes a single black and white CCD sensor.
4. The image processing apparatus of claim 1, wherein the first processor
20 includes a three CCD color sensor.
5. The image processing apparatus of claim 1, wherein the second processor includes a line-scan CCD sensor.
- 25 6. The image processing apparatus of claim 1, wherein the second processor includes an area-scan CCD sensor.
7. The image processing apparatus of claim 1, wherein the second processor includes a fiber optic bundle to capture and direct the acquired image to the second
30 processor.
8. The image processing apparatus of claim 1, wherein the first processor includes a sensor having a low spectral resolution, and wherein the second processor includes a sensor having a high spectral resolution.

9. The image processing apparatus of claim 1, wherein the first processor and the second processor are in communication such that information from one of the first or second processors can be used to direct the function of the other of the first or second
5 processors.

10. The image processing apparatus of claim 9, wherein information from the first processor can be used to control the registration of the second processor.

10 11. The image processing apparatus of claim 9, wherein the information from the second processor can be used to calibrate the first processor.

12. The image processing apparatus of claim 1, wherein the first and second
processors have different dynamic ranges.

15

13. The image processing apparatus of claim 1, wherein the second processor is removable.

14. An image processing apparatus for use with a printed substrate, the image processing apparatus comprising:

a first processor including a large format sensor to process information from an image acquired from a printed substrate;

5 a second processor including a small format sensor to process information from the same acquired image; and

a fiber optic bundle positioned to receive the acquired image from the printed substrate and operable to direct the acquired image to the second processor;

10 wherein both the first processor and the second processor are operable to process the spectral information from the acquired image.

15 15. The image processing apparatus of claim 14, wherein the first processor is a spatial imaging device.

16. The image processing apparatus of claim 15, wherein the spatial imaging device includes a single CCD, black and white sensor.

17. The image processing apparatus of claim 15, wherein the spatial imaging device is also adapted to process the spectral information from the acquired image.

20

18. The image processing apparatus of claim 14, wherein the second processor includes a line-scan CCD sensor.

19. The image processing apparatus of claim 14, wherein the second processor has a high spectral resolution.

25

20. The image processing apparatus of claim 14, further comprising a third processor that analyzes data from the first and second processors, and wherein the third processor digitizes the data to reduce the effects of scattered light.

30

21. The image processing apparatus of claim 14, wherein information from the first processor can be used to control the registration of the second processor.

22. The image processing apparatus of claim 14, wherein information from the second processor can be used to calibrate the first processor.

23. The image processing apparatus of claim 14, wherein the second processor
5 is removable.

24. A method for monitoring the color of a printed substrate, the method comprising:

5 acquiring an image from a printed substrate;
 providing the acquired image to a first processor; and
 providing the same acquired image to a second processor;
 wherein both the first processor and the second processor are capable of
processing spectral information from the acquired image.

10 25. The method of claim 24, further comprising processing the spatial
information from the acquired image using the first processor and processing the spectral
information from the acquired image using the second processor.

15 26. The method of claim 24, wherein acquiring the image from the printed
substrate includes acquiring a plurality of color portions on the printed substrate within the
image.

20 27. The method of claim 24, wherein processing the spatial information
generates a first signal and processing the spectral information generates a second signal,
and wherein the method further includes processing the first and second signals to correct
for the effects of scattered light.

28. The method of claim 24, further comprising controlling the registration of
the second processor using information from the first processor.

25 29. The method of claim 24, further comprising calibrating the first processor
using information from the second processor.

30. An image processing apparatus for use with a printed substrate, the image processing apparatus comprising:

a first processor that receives at least a first portion of an acquired image from a printed substrate; and

5 a second processor that receives at least a second portion of the acquired image from the printed substrate;

wherein both the first and second processors are capable of processing the spectral information from the first and second portions of the acquired image, respectively.

10 31. The image processing apparatus of claim 30, wherein the first processor includes a large format sensor.

32. The image processing apparatus of claim 30, wherein the first processor includes a three CCD color sensor.

15

33. The image processing apparatus of claim 30, wherein the second processor includes a small format sensor.

20 34. The image processing apparatus of claim 30, wherein the second processor includes an area-scan CCD sensor.

35. The image processing apparatus of claim 30, further comprising:
a first lens;
a light blocker having a slit therein;
25 a second lens; and
a third lens.

36. The image processing apparatus of claim 30, further comprising one of a diffraction grating or a prism.

37. The image processing apparatus of claim 30, wherein information from the first processor is used to register the second processor, and wherein information from the second processor is used to calibrate the first processor.

38. A method for monitoring the color of a printed substrate, the method comprising:

- acquiring an image from multiple color portions on a printed substrate;
- processing information generated from a first portion of the acquired image
- 5 using a first processor;
- processing information generated from a second portion of the acquired image using a second processor;
- registering the second processor using information from the first processor;
- and
- 10 calibrating the first processor using information from the second processor.

39. The method of claim 38, wherein processing information generated from the first portion of the acquired image using the first processor includes processing the

15 spatial and spectral information generated from the first portion of the image.

40. The method of claim 38, wherein processing information generated from the second portion of the acquired image using the second processor includes processing the spatial and spectral information generated from the second portion of the image.

20